TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH

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TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- CLASSICAL RISK FORMULA USED IN REACTOR SAFETY STUDIES AND OTHER SYSTEMS

(1) $R = P \times C$

WHERE R = RISK

P = PROBABILITY OF EVENT

C = CONSEQUENCES OF EVENT

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- SOCIETAL RISK APPROACH FOR NUCLEAR MATERIALS SAFEGUARDS

(2) $R = Pa \times (1 - Pi) \times C$

WHERE Pa = PROBABILITY OF ATTEMPT BY ADVERSARY

Pi = PROBABILITY OF ADVERSARY INTERRUPTION (BY SAFEGUARDS SYSTEM)

C = CONSEQUENCES

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- MAIN DIFFICULTY IS IN ESTIMATING PROBABILITY OF ATTEMPT, Pa

- IN EQUATION (2), DENOTE

  Pa AS THREAT,

  (1-Pi) AS VULNERABILITY,

  C AS CONSEQUENCES,

  GIVING

  R = THREAT x VULNERABILITY x CONSEQUENCES

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- RISK IS A FUNCTION OF THE POTENTIAL THREAT, VULNERABILITY TO THE THREAT, AND THE CONSEQUENCES IF THE THREAT IS CARRIED OUT.

- BY CONSIDERING ALL THREE ELEMENTS, A HIGH RISK DENOTES

  - A PLAUSIBLE THREAT SCENARIO,
  - A TARGET WHICH IS VERY VULNERABLE TO THE THREAT SCENARIO, AND
  - A SEVERE SET OF CONSEQUENCES IF THE THREAT IS CARRIED OUT.

Relative Ranking Scales - Examples

INFRASTRUCTURE TARGET	RISK ELEMENT	THREAT SCENARIO #1	THREAT SCENARIO #2	THREAT SCENARIO #3
OIL REFINERY	THREAT			
	VUL.			
	CONS.			
	OVERALL RISK			
AIRPORT	THREAT		H	
	VUL.		M	
	CONS.		M	
	OVERALL RISK		M	
OFFICE BLDG.	THREAT	H		
	VUL.	M		
	CONS.	H		
	OVERALL RISK	H		
POWER PLANT	THREAT			H
	VUL.			M
	CONS.			L
	OVERALL RISK			M

SIMPLE RISK MATRIX

H - HIGH
M - MEDIUM
L - LOW

- We may use a relative numerical ranking scale for the threats and vulnerabilities for each potential threat objective. An example:
  - 10 = high threat, greatest vulnerability
  - 3 = medium level threats and vulnerability
  - 1 = low threat, not vulnerable

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- "THE ASSETS, FUNCTIONS, AND SYSTEMS WITHIN EACH CRITICAL INFRASTRUCTURE SECTOR ARE NOT EQUALLY IMPORTANT" – NATIONAL STRATEGY FOR HOMELAND SECURITY, JULY 2002.
- VULNERABILITY ASSESSMENTS ARE DEVELOPED USING AN IMPLICIT THREAT SCENARIO, BUT PROBABLY ONLY ONE AND NOT A RANGE.
- BASING UPGRADES ON ONLY ONE OR TWO ELEMENTS OF RISK DOES NOT OPTIMIZE USE OF RESOURCES.
- SECURITY UPGRADES IN SOME AGENCIES IN THE PAST WERE DRIVEN BY VULNERABILITIES OR CONSEQUENCES ALONE.

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

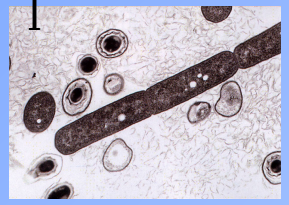
- "ACCORDINGLY, THE FEDERAL GOVERNMENT WILL APPLY A CONSISTENT METHODOLOGY TO FOCUS ITS EFFORTS ON THE HIGHEST PRIORITIES..." - NATIONAL STRATEGY FOR HOMELAND SECURITY, JULY 2002.
- USING DESIGN BASIS THREATS CAN LEAD TO A FALSE SENSE OF SECURITY.
- COMPUTATIONAL METHODS AND/OR EXPERT JUDGMENT ARE CAPABLE OF REASONABLY ACCURATE ESTIMATES OF CONSEQUENCES AND VULNERABILITIES.
- THE THREAT ELEMENT IS THE MOST DIFFICULT TO ESTIMATE.

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

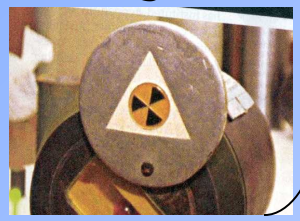
- OF COURSE, WITH PERFECT INTELLIGENCE, THE THREAT CAN BE NEUTRALIZED.
- IN THE ABSENCE OF RELIABLE THREAT INTELLIGENCE WE MUST ACT PRUDENTLY TO USE RESOURCES FOR HIGHEST RISK SCENARIOS AND TARGETS.
- WE BEGIN THE PROCESS WITH THE THREAT ELEMENT: THE THREAT IS DEVELOPED AS A THREAT SCENARIO AGAINST A TARGET OR FACILITY.
- “MAPPING TERRORIST THREATS… AGAINST SPECIFIC FACILITY SECTORAL VULNERABILITIES WILL ALLOW AUTHORITIES TO DETERMINE… WHICH FACILITIES AND SECTORS ARE MOST AT RISK” - NATIONAL STRATEGY FOR HOMELAND SECURITY, JULY 2002.

Threat Targets

Chemical



Biological



Nuclear

EVOLVING TARGETS

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- THREAT SCENARIOS ARE DEVELOPED IN A BRAINSTORMING OR GROUP EFFORT FOR EACH FACILITY OR TARGET.
  - NEED PARTICIPANTS FROM MANY DISCIPLINES AND AN UNBIASED FACILITATOR.
  - NEED HISTORIANS, SPECIAL OPERATIONS OR SIMILAR CAPABILITIES, TECHNICAL EXPERTS ON THE FACILITIES, NUCLEAR, CHEMICAL AND BIOWEAPON EXPERTS, INTELLIGENCE EXPERTS, ETC.
  - THE THREAT SCENARIOS MAY BE ORDERED IN SOME RELATIVE RANKING FROM MOST PROBABLE TO LEAST PROBABLE.

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- THE RELATIVE RISK RANKING BEGINS WITH THE LIST OF THREAT SCENARIOS VERSUS TARGETS OR FACILITIES.
- FOR EACH SCENARIO/TARGET ELEMENT, THE VULNERABILITY AND CONSEQUENCES ARE ESTIMATED.
- ESTIMATES CAN BE QUALITATIVE (HIGH, MED, LOW) OR QUANTITATIVE STATEMENTS ON THE VULNERABILITY AND CONSEQUENCES.
- THE RESULTS ARE ORDERED FROM HIGHEST TO LOWEST PRODUCING A RELATIVE RISK RANKING.

TERRORIST PROTECTION PLANNING USING A RELATIVE RISK REDUCTION APPROACH (Continued)

- RESOURCES ARE USED TO REDUCE THE VULNERABILITY OR MITIGATE THE CONSEQUENCES FOR THE HIGH RISK SCENARIOS.
- AFTER UPGRADES ARE COMPLETED, THE RELATIVE RISK RANKING WILL CHANGE, HENCE THIS IS NOT STATIC, BUT MUST BE UPDATED.
- THIS APPROACH WAS USED BY BNL MANAGEMENT TO SCHEDULE SECURITY UPGRADES FOR ALL MAJOR BNL FACILITIES.
- “PROTECTING AMERICAS CRITICAL INFRASTRUCTURES THUS REQUIRES THAT WE DETERMINE THE HIGHEST RISKS…” - NATIONAL STRATEGY FOR HOMELAND SECURITY, JULY 2002.